

CLAIMS

1 1. In an endoscopic catheter having a distally located tissue cutting device in a
2 lumen thereof comprising an exposed linear cutting member, the improvement for
3 determining the amount of cutting member deployed for cutting which comprises:

4 providing said cutting member with a plurality of radiopaque indicia located
5 at radiologically measurable intervals.

1 2. Catheter of claim 1 wherein said catheter has:
2 a radiopaque reference point to determine the length of the deployed cutting
3 member by reference to said indicia.

1 3. Catheter of claim 2 wherein the cutting member is a needle knife and said
2 radiopaque reference point is at the distal end of said catheter.

1 4. Catheter of claim 2 wherein the cutting member is a sphincterotome wire and
2 said radiopaque reference point is on said catheter proximal to said wire.

1 5. Catheter of claim 1 wherein said radiopaque indicia are referenced from a
2 middle of said cutting member and alternate along a length of said cutting member as a
3 function of the distance from said middle thereof.

1 6. In an endoscopic catheter having a distally located tissue cutting device in a
2 lumen thereof comprising an exposed linear cutting member, the improvement for
3 determining the amount of cutting member deployed for cutting which comprises:

4 providing said cutting member with a plurality of radiopaque indicia located
5 at radiologically measurable intervals; and

1 a radiopaque reference point to determine the length of the deployed cutting
2 member by reference to said indicia.

1 7. Catheter of claim 6 wherein the cutting member is a needle knife and said
2 radiopaque reference point is at the distal end of said catheter.

1 8. Catheter of claim 6 wherein the cutting member is a sphincterotome wire and
2 said radiopaque reference point is on said catheter proximal to said wire.

1 9. Catheter of claim 6 wherein said radiopaque indicia are referenced from a
2 middle of said cutting member and alternate along a length of said cutting member as a
3 function of the distance from said middle thereof.

1 10. In an endoscopic catheter having a cable actuated needle knife in a lumen
2 thereof, said needle knife being deployable from a distal end of said catheter, the
3 improvement for substantially preventing movement of said needle knife after deployment
4 which comprises one or more spaced apart detents along said cutting member which interact
5 with one or more notches in the distal end of said lumen thereby providing resistance to
6 movement.

1 11. Catheter of claim 10 wherein said detents are evenly spaced along a length
2 of the cutting member.

1 12. In an endoscopic catheter having a distally located tissue cutting device in a
2 lumen thereof comprising an exposed linear cutting member, the improvement for
3 determining the amount of cutting member deployed for cutting and for substantially
4 preventing movement of said cutting member which comprises:

1 providing said cutting member with a plurality of radiopaque indicia located
2 at radiologically measurable intervals and one or more spaced apart detents to interact with
3 one or more notches in the distal end of said lumen thereby providing resistance to said
4 movement.

1 13. Catheter of claim 12 wherein said catheter:
2 a radiopaque reference point to determine the length of the deployed cutting
3 member by reference o said indicia.

1 14. Catheter of claim 13 wherein the cutting member is a needle knife and said
2 radiopaque reference point is at the distal end of said catheter.

1 15. Catheter of claim 13 wherein the cutting member is a sphincterotome wire and
2 said radiopaque reference point is on said catheter proximal to said wire.

1 16. Catheter of claim 12 wherein said radiopaque indicia are referenced from a
2 middle of said cutting member and alternate along a length of said cutting member as a
3 function of the distance from said middle thereof.

1 17. In an endoscopic catheter having a distally located tissue cutting device in a
2 lumen thereof comprising an exposed linear cutting member, the improvement for
3 determining the amount of cutting member deployed for cutting and for substantially
4 preventing movement of said cutting member which comprises:

5 providing said cutting member with a plurality of radiopaque indicia located
6 at radiologically measurable intervals and one or more spaced apart detents to interact with
7 one or more notches in the distal end of said lumen thereby providing resistance to said
8 movement; and

1 a radiopaque reference point to determine the length of the deployed cutting
2 member by reference of said indicia.

1 18. Catheter of claim 17 wherein the cutting member is a needle knife and said
2 radiopaque reference point is at the distal end of said catheter.

1 19. Catheter of claim 17 wherein the cutting member is a sphincterotome wire and
2 said radiopaque reference point is on said catheter proximal to said wire.

1 20. Catheter of claim 17 wherein said radiopaque indicia are referenced from a
2 middle of said cutting member and alternate along a length of said cutting member as a
3 function of the distance from said middle thereof.

1 21. In an endoscopic catheter having a distally located tissue cutting device in a
2 lumen thereof comprising an exposed linear cutting member, the improvement for
3 determining the amount of cutting member deployed for cutting which comprises:

4 providing said cutting member with a plurality of visual indicia located at
5 visually measurable intervals.

1 22. Catheter of claim 21 wherein said catheter has:
2 a visual reference point to determine the length of the deployed cutting
3 member by reference to said indicia.

1 23. Catheter of claim 22 wherein the cutting member is a needle knife and said
2 visual reference point is at the distal end of said catheter.

1 24. Catheter of claim 22 wherein the cutting member is a sphincterotome wire and
2 said visual reference point is on said catheter proximal to said wire.

1 25. Catheter of claim 21 wherein said visual indicia are referenced from a middle
2 of said cutting member and alternate along a length of said cutting member as a function of
3 the distance from said middle thereof.

1 26. Catheter of claim 21 wherein said visual indicia include different color
2 markings.

1 27. Method for exposing a tissue cutting device located in a distal portion of a
2 lumen of an endoscope catheter which comprises:

3 providing said cutting member with a plurality of radiopaque indicia located
4 at radiologically measurable intervals along a length of said cutting member;

5 deploying said cutting member; and

6 radiologically determining the length of said cutting member deployed.

1 28. Method of claim 21 wherein said step of radiologically determining said
2 length uses a radiopaque reference point.

1 29. Method of claim 22 wherein said cutting member is a needle knife and said
2 radiopaque reference point is at the distal end of said catheter.

1 30. Method of claim 22 wherein said cutting member is a sphincterotome wire
2 and said radiopaque reference point is on said catheter proximal of said wire.

1 31. Method for exposing a tissue cutting device located in a distal portion of a
2 lumen of an endoscope catheter which comprises:

3 providing said cutting member with a plurality of radiopaque indicia located
4 at radiologically measurable intervals along a length of said cutting member and a
5 radiopaque reference point;

6 deploying said cutting member; and
7 radiologically determining the length of said cutting member which is
8 exposed.

1 32. Method of claim 25 wherein said cutting member is a needle knife and said
2 radiopaque reference point is at the distal end of said catheter.

1 33. Method of claim 25 wherein said cutting member is a sphincterotome wire
2 and said radiopaque reference point is one said catheter proximal of said wire.

1 34. Method for preventing movement of an exposed portion of a deployed cutting
2 knife located in a distal portion of a lumen of an endoscopic catheter which comprises:

3 providing said cutting member with a plurality of detents located at spaced
4 intervals;

5 providing the distal end of said catheter with a corresponding notch; and
6 engaging said notch and a detent upon deployment of said knife at a desired
7 length to prevent movement of said deployed cutting knife.